

I. VALIDITY OF APPROACH

THE RESEARCH PROPOSAL'S OBJECTIVE IS TO DEVELOP A PLANT-LEVEL SIMULATION TECHNIQUE TO SUPPORT EVALUATIONS OF THE PERFORMANCE DEGRADE OF WORKERS UNDER CONDITIONS OF PLANT EXPLOSION.

OPHARS REASONABLY HOLD THAT SIMULATIONS, AT THE SIMULATION LEVEL, ARE USEFUL AND USEFUL, WITH ACTUAL FLASHES AT LOW ILLUMINATION LEVELS, ARE PREDICTIVE ENOUGH. THE SIMULATION WOULD SEEM, AT LOW LEVELS, AS IF THE PREDICTIVE TASKS ARE CLEARLY GENERALIZABLE TO ACTUAL SITUATIONS. WE ARE CONCERNED THAT SINCE ACTUAL HUMAN INTEGRAL DATA HAVE NOT BEEN ESTABLISHED, AND THEREFORE THE INTENSITIES OF ACTUAL FLASHES REQUIRED ARE UNKNOWN, THAT THE PREDICTIVE USEFULLNESS OF THE SIMULATION DATA WILL BE LIMITED TO ACTUALLY TYPICAL LEVELS OF EXPOSURE. IF PREDICTIVE EVALUATIONS CAN IGNORE THE POSSIBILITY OF HARMFUL EFFECTS, THEN THE SIMULATION PREDICTIONS COULD POSSIBLY BE VALUABLE, WITH REFERENCE TO INDIVIDUALS EXPOSED AT LOW EXPOSURE LEVELS, THOSE WHOSE DAILY AND OCCASIONALLY RECEIVING EXPOSURES INTENSITIES SIMILAR TO THOSE TESTED IN THE STUDY. HOWEVER, IT SHOULD BE CLEARLY UNDERSTOOD, THAT THE SIMULATION PREDICTIONS SHANT NOT BE RELIABLE FOR HIGH INTENSITY EXPOSURES, REGARDLESS OF WHETHER PERMANENT EYE DAMAGE ENDS.

II. TASK RELEVANCES

THE PROPOSAL DOES NOT PRESENT THE PERFORMANCE TASKS IN SUFFICIENT DETAIL TO ALLOW EVALUATIONS OF ACCURACY AND RELEVANCE. OUR EXPERIENCE INDICATES THAT PERFORMANCE TASK DESIGN, MEASUREMENT AND INTERPOLATIVE POWER IN THE PROPOSED STUDY MAY BE VERY DIFFICULT TO ACHIEVE, WHILE THE SIMULATION TECHNIQUE ITSELF MAY BE RELATIVELY EASY TO ACHIEVE. THE TASKS, MEASUREMENTS METHODS AND FIELD APPLICABILITY SHOULD BE ELABORATED FURTHER SINCE PERFORMANCE ESTIMATES ARE THE PRIMARY OUTPUT OF THE PROPOSED WORK.

III. CONCLUSIONS

IF HUMAN PERFORMANCE DATA ARE NEEDED UNDER CONDITIONS OF PLANT EXPLOSION CORRESPONDING TO PLANT-LEVELNESS RECOVERING FULLY THE HUMAN INTENSITY EXPOSURE, THEN THE PROPOSED SIMULATION

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THE PRIMARY OUTPUT DESIRED IS AN incapacitated or dead primate.

QUESTIONS EXIST AS TO THE ACCURACY OF THE MODEL UPON WHICH THE PREDICTIONS OF THE SIMULATION TECHNIQUE ARE BASED WHEN EMPLOYING FLASH INCAPACITATION WHICH ARE POTENTIALLY DANGEROUS. THESE QUESTIONS MIGHT BE BEST APPROACHED IN SUPPLEMENTARY EXPERIMENTS USING ANIMALS.

4. GENERAL REMARKS

WITH RESPECT TO THE OVERALL QUESTION OF THE EFFICACY OF FLASH & INDEED INCAPACITATION, OUR PRELIMINARY THINKING IS THAT THE TECHNIQUE WOULD BE MOST VALUABLE AS AN ADJUGCT TO OTHER TACTICS. THERE MAY BE A NUMBER OF SITUATIONS IN WHICH A FEW SECONDS OF DISORIENTATION, CONFUSION AND IMPAIRED VISION WOULD ALLOW FRIENDLY PERSONNEL TO ACCOMPLISH SOME VITAL OBJECTIVE OR PERMIT THE CAPTURE OR RESTRAINT OF UNFRIENDLY INDIVIDUALS. THE FLASH TACTIQUE WOULD BE MOST USEFUL AT NIGHT; IT WOULD NOT BE AN INCONSPICUOUS TACTIC.

5. CONSIDERING THE OPERATIONAL DEPLOYMENT OF ANY FLASH BLINDNESS SYSTEM, IT WOULD SEEK IMPERATIVE TO KNOW THE CONSTRAINTS ON THE USE OF THE SYSTEM. THESE CONSTRAINTS WOULD DICTATE WHEN, HOW & IN UNDER WHAT CONDITIONS THE SYSTEM MIGHT BE USED. THEY WOULD AFFECT THE CHOICE OF DELIVERY SYSTEM. IF A GRENADE OR OTHER PROJECTILE-TYPE DELIVERY SYSTEM WERE USED, A SMALL ERROR IN PLACEMENT OF THE PYROTECHNIC DEVICE COULD MEAN A HUNDREDFOLD (OR MORE) DIFFERENCE IN LIGHT INTENSITY AT THE TARGET POINT. THIS IS A STRAIGHTFORWARD EFFECT OF THE INVERSE SQUARE LAW.

SPECIFICALLY, IT SEEMS AS THOUGH THE RETINAL AGE THRESHOLD FOR LIGHT FLASHES MUST BE DETERMINED BEFORE FLASHES BE USED OPERATORIALLY. IT WOULD SEEM, TOO, THAT GROSS OR EVEN MICROSCOPIC RETINAL DAMAGE CRITERIA ARE NOT ACCEPTABLE WHERE HUMAN EXPOSURE IS CONTEMPLATED -- ESPECIALLY IF NON-BELLIGERENT INDIVIDUALS ARE INVOLVED. IF SAFE EXPOSURE CRITERIA ARE NOT EVEN AVAILABLE FOR EXPERIMENTAL TESTS OF THE FLASHES, THEN IT WOULD APPEAR THAT WE DON'T KNOW ENOUGH TO USE THESE DEVICES OPERATORIALLY -- EVEN IF WE CAN PREDICT THE PERFORMANCE DECREMENT EXPECTED.

5. ALTERNATE SUPPLEMENTARY APPROACHES:

SOPHISTICATED PRIMATE STUDIES COULD PROVIDE INFORMATION AS TO THE FUNCTIONAL DAMAGE THRESHOLD. [] FOR EXAMPLE, IS SUCCESSFULLY USING TARGET RINGS OF VARYING []

CAP WIDTH TO MEASURE VISUAL ACUITY IN MONKEYS; THERE ARE OTHER TECHNIQUES. EVOKED POTENTIALS ARE A GOOD MEANS OF MEASURING VISUAL THRESHOLD -- A TECHNIQUE BEING USED FOR AT LEAST []

IN ADDITION TO MEASURING DAMAGE THRESHOLD, EXPERIMENTS WITH TRAINED PRIMATES COULD PROVIDE A MEASURE OF PERFORMANCE DECREMENT FOLLOWING EXPOSURE TO THE ACTUAL FLASHES THEMSELVES. HUMAN PERFORMANCE UNDER SIMILAR CONDITIONS FURNISHES MATHEMATICAL FROM THESE RESULTS. WHILE PERFORMANCE DECREMENT BY NO MEANS CONDITIONS OF SIMULATED FLASH INCAPACITATION MAY BE IMPORTANT TO KNOW, THERE APPEARS TO BE ALSO USEFUL INFORMATION RELATED TO THE ACCEPTABLE INTENSITY LEVEL OF REAL FLASHES FOR USE UNDER REAL FIELD CONDITIONS. THESE LATTER WOULD MIGHT ETTEND TO DETERMINE FLASH CAPABILITY LEVEL & THE LIKE.